

>human SULF1 full length cDNA (ORF highlighted in capitals)

ccaccaccatcatctaaagaagataaacttggcgaatgacatgcaggttctcaaggcagaataattgcagaaaatcttcaaa
ggaccctatctgcagatgttctgaatacctctgagaatagagattgatttcaaccaggatacctaattcaaggactccagaaat
caggagacggagacattttgtcagttttgcaacattggacaaaatacaATGAAGTATTCTTGCTGTGCTCTGG
TTTTGGCTGTCCTGGGCACAGAATTGCTGGGAAGCCTCTGTTGACTGTGAGATCCCC
GAGGTTTCAGAGGACGGATACAGCAGGAACGAAAAAACATCCGACCCAACATTATTCTTG
TGCTTACCGATGATCAAGATGTGGAGCTGGGGTCCCTGCAAGTCATGAACAAAACGAG
AAAGATTATGGAACATGGGGGGGGCCACCTTCATCAATGCCTTTGTGACTACACCCATGT
GCTGCCCGTCACGGTCCCTCCATGCTCACCGGGAAGTATGTGCACAATCACAATGTCTA
CACCAACAACGAGAACTGCTCTTCCCCCTCGTGGCAGGCCATGCATGAGCCTCGGACT
TTTGCTGTATATCTTAACAACACTGGCTACAGAACAGCCTTTTTTGGAAAATACCTCAATG
AATATAATGGCAGCTACATCCCCCCTGGGTGGCGAGAATGGCTTGGATTAATCAAGAATT
CTCGCTTCTATAATTACACTGTTTGTGCGCAATGGCATCAAAGAAAAGCATGGATTGATTA
TGCAAAGGACTACTTCACAGACTTAATCACTAACGAGAGCATTAACTTCAAAATGTCT
AAGAGAATGTATCCCCATAGGCCCGTTATGATGGTGATCAGCCACGCTGCGCCCCACG
GCCCCGAGGACTCAGCCCCACAGTTTTCTAAACTGTACCCCAATGCTTCCCAACACATA
ACTCCTAGTTATAACTATGCACCAAATATGGATAAACACTGGATTATGCAGTACACAGGAC
CAATGCTGCCCATCCACATGGAATTTACAAACATTCTACAGCGCAAAAGGCTCCAGACT
TTGATGTCAGTGGATGATTCTGTGGAGAGGCTGTATAACATGCTCGTGGAGACGGGGG
AGCTGGAGAATACTTACATCATTACACCGCCGACCATGGTTACCATATTGGGCAGTTTG
GACTGGTCAAGGGGAAATCCATGCCATATGACTTTGATATTCGTGTGCCTTTTTTTATTCT
GTGGTCCAAGTGTAGAACCAGGATCAATAGTCCCACAGATCGTTCTCAACATTGACTTG
GCCCCACGATCCTGGATATTGCTGGGCTCGACACACCTCCTGATGTGGACGGCAAGT
CTGTCCTCAAACCTTCTGGACCCAGAAAAGCCAGGTAACAGGTTTCGAACAAACAAGAA
GGCCAAAATTTGGCGTGATACATTCTAGTGGAAGAGAGGCAAATTTCTACGTAAGAAGG
AAGAATCCAGCAAGAATATCCAACAGTCAAATCACTTGCCCAAATATGAACGGGTCAA
GAACTATGCCAGCAGGCCAGGTACCAGACAGCCTGTGAACAACCGGGGCAGAAGTGG
CAATGCATTGAGGATACATCTGGCAAGCTTCGAATTCACAAGTGTAAAGGACCCAGTGA
CCTGCTCACAGTCCGGCAGAGCACGCGGAACCTCTACGCTCGCGGCTTCCATGACAA
AGACAAAGAGTGCAGTTGTAGGGAGTCTGGTTACCGTGCCAGCAGAAGCCAAAGAAAG
AGTCAACGGCAATTCTTGAGAAACCAGGGGACTCCAAAGTACAAGCCCAGATTTGTCC
ATACTCGGCAGACACGTTCTTGTCCGTGCAATTTGAAGGTGAAATATATGACATAAATC
TGGAAGAAGAAGAAGATTGCAAGTGTGCAACCAAGAAACATTGCTAAGCGTCATGAT
GAAGGCCACAAGGGGCCAAGAGATCTCCAGGCTTCCAGTGGTGGCAACAGGGGCGAG
GATGCTGGCAGATAGCAGCAACGCCGTGGGCCACCTACCACTGTCCGAGTGACACA
CAAGTGTTTTATTCTTCCCAATGACTCTATCCATTGTGAGAGAGAACTGTACCAATCGGC
CAGAGCGTGGAAGGACCATAAGGCATACATTGACAAAGAGATTGAAGCTCTGCAAGATA
AAATTAAGAATTTAAGAGAAGTGAGAGGACATCTGAAGAGAAGGAAGCCTGAGGAATGT
AGCTGCAGTAAACAAAGCTATTACAATAAAGAGAAAGGTGTAAAAAAGCAAGAGAAATTA
AAGAGCCATCTTCACCCATTCAAGGAGGCTGCTCAGGAAGTAGATAGCAAACCTGCAACT
TTTCAAGGAGAACAACCGTAGGAGGAAGAAGGAGAGGAAGGAGAAGAGACGGCAGAG
GAAGGGGGAAGAGTGCAGCCTGCCTGGCCTCACTTGCTTCACGCATGACAACAACCA
CTGGCAGACAGCCCCGTTCTGGAACCTGGGATCTTTCTGTGCTTGCACGAGTTCTAAC
AATAACACCTACTGGTGTTTGGGTACAGTTAATGAGACGCATAATTTCTTTTCTGTGAGT
TTGCTACTGGCTTTTTGGAGTATTTTGATATGAATACAGATCCTTATCAGCTCACAAATAC
AGTGACACCGGTAGAACCAGGACATTTGAATCAGCTACACGTACAACCTAATGGAGCTCA
GAAGCTGTCAAGGATATAAGCAGTGCAACCCAAAGACCTAAGAATCTTGATGTTGGAAAT
AAAGATGGAGGAAGCTATGACCTACACAGAGGACAGTTATGGGATGGATGGGAAGGTT

FIG. 1A i

AAtcagccccgtctcactgcagacatcaactggcaaggcctagaggagctacacagtgtgaatgaaaacat
ctatgagtacagacaaaactacagacttagtctggtggactggactaattactgaaggatttagatagagtatt
gcactgctgaagagtcactatgagcaaaaataaaacaaataagactcaaactgctcaaagtgacgggttctg
gtgtctctgctgagcacgctgtgtcaatggagatggcctctgctgactcagatgaagacccaaggcataaggt
tgggaaaacaccctattgacctggcagctgacctcaaaccctgcatthgaaccgaccaacattaagtccag
agagttaaactgaatggaataacgacattccagaagttaattgaattctgaacactggagaaaaaccga
aaaatggacggggcatgaagagactaatcatctggaaaccgatttcagtggcgatggcatgacagagctag
agctcggggcccgagcccgaggctgcagcccattcgcaggcacccgaaagaactccccagtatggtggtcct
ggaaaggacattttgaagatcaactatatcttctgtgcatccgatggaatttcagttcatcagatgtccaccatg
gccaccgcagaacaccgaagtaattccagcatagcgggggaagatgttgaccaagggtggagaagaatcac
gaaaaggagaagtcacagcacctagaaggcagcgccctctctcactctcctctgattagatgaaactgttac
cttaccctaaacacagtatcttttaactttttattgttaaactaataaaggtaatcacagccaccaacattcaa
gctaccctgggtaccttgtgtagtagaagctagtgagcatgtgagcaagcgggtgacacgggagactcatc
gttataattactatctgccaagagtagaaagaaaggctggggatatttgggtggctgtgtttgattttgctgttt
gtttgtttgtactaaaacagttatctttgaatatcgtagggacataagtatatacatgttatccaatcaagatgg
ctagaatgggtgcttctgagtgctaaaactgacacccctggtaaatctttcaacacactccactgctgcgta
atgaagtttgattcatthtaaccactggaattttcaatgccgtcattttcagttagatgattttgcactttgagattaa
aatgccatgtctattgattagctctatthttttttacaggcctatcagctcactgttggctgctattgtgacaaagt
caaataaaccaccaaggacgacacacagtatggatcacatattgtttgacattaagctttgccagaaaatgtt
gcatgtgtttacctcgacttgctaaaatcgattagcagaaaggcatggctaataatgttgggtgtaaaaataat
aaataagtaaaacaaaatgaagattgcctgctctctgctgctagcctcaaagcgttcatacatataccttt
aagattgctatatttgggttatttctgacaggagaaaaagatctaaagatcttttattttcatctttttggtttctgg
catgactaagaagcttaaatgttgataaaaatagactagtttgaatttacaccaagaactctcaataaaaagaa
aatcatgaatgtccacaattcaacataaccacaagagaagtaatttctaacattgtgtctatgattttgtaa
gaccttcaccaagttctgatatcttttaagacatagttcaaaattgctttgaaaatctgtattcttgaaaatctctt
gttgtgtattaggttttaataaccagctaaaggattacctcactgagtcacagtaacctctattcagctcccaa
gatgatgtgttttgcttaccctaagagaggttttctctatttttagataattcaagtgcctagataaattatgtttctt
aagtgtttatggtaaaactcttttaagaaaatttaatatgttatagctgaatcttttgtaactttaaatctttatcatag
actctgtacatatgttcaaattagctgctgcctgatgtgtgtatcatcggtgggatgacagaacaaacataattat
gatcatgaataatgtgctttgtaaaaagattcaagttattaggaagcatactctgttttttaacatgtataatattcc
atgatactttatagaacaattctggcttcaggaaagtctagaagcaatatttcttcaataaaaagggtgttaaaactt
taaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

FIG. 1A ii

10025955-122101

>human SULF1 amino acid sequence--translation of ORF
MKYSCCALVLAVLGTELLGSLCSTVRSPRFRGRIQQERKNIRPNILVLTDDQDVELG
SLQVMNKTRKIMEHGGATFINAFVTTTPMCCPSRSSMLTGKYVHNHNVYTNNECS
SPSWQAMHEPRTFAVYLNNTGYRTAFFGKYLNEYNGSYIPPGWREWLGLIKNSRF
YNYTVCRNGIKEKHGFDYAKDYFTDLITNESINYFKMSKRMYPHRPVMMVISHAAP
HGPEDSAPQFSKLYPNASQHITPSYNYAPNMDKHWIMQYTGPMPLIHMEFTNILQR
KRLQTLMSVDDSVRLYNMLVETGELENTYIIYTADHGYPHIGQFGLVKGKSMYPDF
DIRVPFFIRGPSVEPGSIVPQIVLNIDLAPTILDIAGLDTPPDVDGKSVLKLLDPEKPG
NRFRTNKKAKIWRDFTLVERGKFLRKKEESSKNIQQSNHLPKYERVKELCQQARY
QTACEQPGQKWQCIEDTSGKLRIHKCKGPSDLLTVRQSTRNLYARGFHDKDKECS
CRESGYRASRSQRKSQRQFLRNQGTTPKYKPRFVHTRQTRSLVEFEFEIYDINLE
EEEEELQVLQPRNIAKRHDEGHKGPRDLQASSGGNRGRMLADSSNAVGPPTTVRV
THKCFILPNDSIH CERELYQSARAWKDHKAYIDKEIEALQDKIKNLREVRGHLKRRK
PEECSCSKQSYYNKEKGVKKQEKLKSHLHPFKEAAQEVDSKLQLFKENNRRRKKE
RKEKRRQRKGEECSLPGLTCFTHDNNHWQTAPFWNLGSFCACTSSNNNTYWCL
RTVNETHNFLFCFATGFLEYFDMNTDPYQLTNTVHTVERGILNQLHVQLMELRSC
QGYKQCNPRPKNLDVGNKDGGSYDLHRGQLWDGWEG

FIG. 1B

FIG. 1B

>human SULF2 full length cDNA (ORF highlighted in capitals)

TGA^gactcccgcatcccaaaagaagcaccagatcagcaaaaaaagaagATGGGCCCCCGAGCCTCGT
GCTGTGCTTGCTGTCCGCAACTGTGTTCTCCCTGCTGGGTGGAAGCTCGGCCTTCCT
GTCGCACCACCGCCTGAAAGGCAGGTTTCAGAGGGACCGCAGGAACATCCGCCCCA
ACATCATCCTGGTGCTGACGGACGACCAGGATGTGGAGCTGGGTTCCATGCAGGTG
ATGAACAAGACCCGCGCATCATGGAGCAGGGCGGGGCGCACTTCATCAACGCCTT
CGTGACCACACCCATGTGCTGCCCCTCACGCTCCTCCATCCTCACTGGCAAGTACGT
CCACAACCACAACACCTACACCAACAATGAGAACTGCTCCTCGCCCTCCTGGCAGGC
ACAGCACGAGAGCCGCACCTTTGCCGTGTACCTCAATAGCACTGGCTACCGGACAGC
TTTCTTCGGGAAGTATCTTAATGAATACAACGGCTCCTACGTGCCACCCGGCTGGAAG
GAGTGGGTCCGACTCCTTAAAAACTCCCGCTTTTATAACTACACGCTGTGTCCGAACG
GGGTGAAAGAAAAGCACGGCTCCGACTACTCCAAGGATTACCTCACAGACCTCATCA
CCAATGACAGCGTGAGCTTCTTCCGCACGTCCAAGAAGATGTACCCGCACAGGCCAG
TCCTCATGGTCATCAGCCATGCAGCCCCCACGGCCCTGAGGATTCAGCCCCACAAT
ATTCACGCCTCTTCCCAACGCATCTCAGCACATCACGCCGAGCTACAACCTACGCGC
CCAACCCGGACAAACACTGGATCATGCGCTACACGGGGGCCCATGAAGCCCATCCACA
TGGAATTCACCAACATGCTCCAGCGGAAGCGCTTGACAGACCCTCATGTCCGTGGACG
ACTCCATGGAGACGATTTACAACATGCTGGTTGAGACGGGCGAGCTGGACAACACGT
ACATCGTATACACCGCCGACCACGGTTACCATCATCGGCCAGTTTGGCCTGGTGAAAG
GGAAATCCATGCCATATGAGTTTGACATCAGGGTCCCGTTCTACGTGAGGGGGCCCCA
ACGTGGAAGCCGGCTGTCTGAATCCCCACATCGTCCTCAACATTGACCTGGCCCCCA
CCATCCTGGACATTGCAGGCCTGGACATACCTGCGGATATGGACGGGAAATCCATCCT
CAAGCTGCTGGACACGGAGCGGCCGGTGAATCGGTTTCACTTGAAAAAGAAGATGA
GGGTCTGGCGGGACTCCTTCTTGGTGGAGAGAGGCAAGCTGCTACACAAGAGAGAC
AATGACAAGGTGGACGCCAGGAGGAGAACTTTCTGCCCAAGTACCAGCGTGTGAA
GGACCTGTGTGAGCGTGCTGAGTACCAGACGGCGTGTGAGCAGCTGGGACAGAAGT
GGCAGTGTGTGGAGGACGCCACGGGGAAGCTGAAGCTGCATAAGTGCAAGGGCCC
CATGCGGCTGGGCGGCAGCAGAGCCCTCTCCAACCTCGTGCCCAAGTACTACGGGC
AGGGCAGCGAGGCCTGCACCTGTGACAGCGGGGACTACAAGCTCAGCCTGGCCGG
ACGCCGGAAAAAACTCTTCAAGAAGAAGTACAAGGCCAGCTATGTCCGCAGTCGCTC
CATCCGCTCAGTGGCCATCGAGGTGGACGGCAGGGTGTACCACGTAGGCCTGGGTG
ATGCCGCCAGCCCCGAAACCTACCAAGCGGCACTGGCCAGGGGGCCCCCTGAGGA
CCAAGATGACAAGGATGGTGGGGACTTCAGTGGCACTGGAGGCCTTCCCAGTACT
CAGCCGCCAACCCCATTAAGTGACACATCGGTGCTACATCCTAGAGAACGACACAG
TCCAGTGTGACCTGGACCTGTACAAGTCCCTGCAGGCCTGGAAAGACCACAAGCTG
CACATCGACCACGAGATTGAAACCCTGCAGAACAAAATTAAGAACCTGAGGGAAGTC
CGAGGTCACCTGAAGAAAAAGCGGCCAGAAGAATGTGACTGTCACAAAATCAGCTAC
CACACCCAGCACAAAGGCCGCCTCAAGCACAGAGGCTCCAGTCTGCATCCTTTCAG
GAAGGGCCTGCAAGAGAAGGACAAGGTGTGGCTGTTGCGGGAGCAGAAGCGCAAG
AAGAACTCCGCAAGCTGCTCAAGCGCCTGCAGAACAACGACACGTGCAGCATGCC
AGGCCTCACGTGCTTACCCACGACAACCAGCACTGGCAGACGGCGCCTTTCTGGA
CACTGGGGCCTTTCTGTGCCTGCACCAGCGCCAACAATAACACGTACTGGTGCATGA
GGACCATCAATGAGACTCACAATTTCTTCTGTGAATTTGCAACTGGCTTCCTAGA
GTACTTTGATCTCAACACAGACCCCTACCAGCTGATGAATGCAGTGAACACACTGGAC
AGGGATGTCCTCAACCAGCTACACGTACAGCTCATGGAGCTGAGGAGCTGCAAGGGT
TACAAGCAGTGTAAACCCCGGACTCGAAACATGGACCTGGGACTTAAAGATGGAGGA
AGCTATGAGCAATACAGGCAGTTTCAGCGTCGAAAGTGGCCAGAAATGAAGAGACCT
TCTTCCAAATCACTGGGACAACTGTGGGAAGGCTGGGAAGGTTAAgaacaacagaggtgg

FIG. 2A i

10025966-123101

acctccaaaaacatagaggcatcacctgactgcacaggcaatgaaaaacatgtgggtgattccagcagacctgtgctat
tggccaggaggcctgagaaagcaagcacgcactctcagtcaacatgacagattctggaggataaccagcaggagcaga
gataactcaggaagtcattttgcccctgctttgcttggattatacctcaccagctgcacaaaatgcatttttcgtatcaaaa
agtcaccactaaccctccccagaagctcacaaggaaaaacggagagagcgagcgagagagattccttggaatttctc
ccaagggcgaaagtcattggaattttaaatcataggggaaaagcagtcctgttctaaatcctcttattctttggttgtcacaaa
gaaggaactaagaagcaggacagaggcaacgtggagaggctgaaaacagtgcagagacgttgacaatgagtcagta
gcacaaaagagatgacatttacctagcactataaacctggtgcctctgaagaaactgccttcattgtatatatgtgactattta
catgtaatcaacatgggaacttttaggggaacctataagaaatccaatttccaggagtgggtgtcaataaacgcctctgtg
gccagtgtaaaagaaaaaaaaaaaaaaaaa

FIG. 2A ii

FIG. 2A ii

>human SULF2 amino acid sequence--translation of ORF
MGPPSLVLCLLSATVFSLLGGSSAFLSHHRLKGRFQRDRRNIRPNIILVLTDDQDVELGSM
QVMNKTRRIMEQGGGAHFNAFVTTMCCPSRSSILTGYVHNHNTYTNNENCSSPSWQ
AQHESRTFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFYNYTLCRN
GVKEKHGSDYSKDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHGPEDSAPQYS
RLFPNASQHITPSYNYAPNPDKHWMRYTGPMKPIHMEFTNMLQQRKRLQTLMSVDDSM
TIYNMLVETGELDNTYIVYTADHGYHIGQFGLVKGKSMPIYEFDIRVPFYVRGPNVEAGCL
NPHIVLNIDLAPTILDIAGLDIPADM DGKSILKLLDTERPVNRFHLKKKMRVWRDSFLVERG
KLLHKRDNDKVDAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCVEDATGKLLKH
KCKGPMRLGGSRALSNLVPKYYGQGSEACTCDSGDYKLSLAGRRKKLFKKKYKASYVR
SRSIRSV AIEVDGRVYHVGLGDAAQPRNLTKRHWPGAPEDQDDKDGGDFSGTGGLPDY
SAANPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKIKNLREVRGHL
KKKRPEECDCHKISYHTQHKGRCLKHRGSSLHPFRKGLQEKDKVWLLREQKRKKKLRLKL
KRLQNNDTC SMPGLTCFTHDNQHWQTAPFWTLGPFCACTSANNNTYWCMRTINETHN
FLFCEFATGFLEYFDLNTDPYQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQCNPRTR
NMDLGLKDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWEG

FIG. 2B

10025966-123101

>mouse SULF1 full length cDNA (ORF fragments highlighted in capitals)

cttcaccttgagaaggatgaattccctaagacatgcagtttctcaagccagaatccttgagggaaccttcaaaggactcctt
ctgcagatgttttgaaacctctgagctagaaatcgattattcacccaggataccttattcaagctcccagaactcacccgacc
aaggagcttgaagactttgcaactttggaccaagcacaATGAAGTATTCCCTCTGGGCTCTGCTGCTT
CCCCTGCTGGGCACACAGCTGCTGGGAACCCCTGTGTTCCACCGTTCCGGTCCCAGAG
GTTCCGAGGAAGGATACAGCAGGAACGAAAAACATCCGACCCAACATTATTCTTGTG
CTTACCGATGATCAAGATGTGGAGCTGGGGTCCCTGCAAGTCATGAACAAAACGAGA
AAGATTATGGAACATGGGGGGGCCACCTTCATCAATGCCTTTGTGACTACACCCATGT
GCTGCCCCGTCACGGTCTCCATGCTCACCGGGAAGTATGTGCACAATCACAATGTCT
ACACCAACAACGAGAACTGCTCTTCCCCCTCGTGGCAGGCCATGCATGAGCCTCGG
ACTTTTGTCTGTATATCTTAACAACACTGGCTACAGAACAGCCTTTTTTGGAAAATACCT
CAATGAATATAATGGCAGCTACATCCCCCTGGGTGGCGAGAATGGCTTGGATTAATC
AAGAATTCTCGCTTCTATAATTACACTGTTTGTGCAATGGCATCAAAGAAAAGCATGG
ATTTGATTATGCAAAGGACTACTTCACAGACTTAATCACTAACGAGAGCATTAACTT
CAAAATGTCTAAGAGAATGTATCCCCATAGGCCCGTTATGATGGTGATCAGCCACGCT
GCGCCCCACGGCCCCGAGGACTCAGCCCCACAGTTTTCTAAACTGTACCCCAATGCT
TCCCAACACATAACTCCTAGTTATAACTATGCACCAAATATGGATAAACACTGGATTATG
CAGTACACAGGACCAATGCTGCCCATCCACATGGAATTTACAAACATTCTACAGCGCA
AAAGGCTCCAGACTTTGATGTCAGTGGATGATTCTGTGGAGAGGCTGTATAACATGCT
CGTGGAGACGGGGGAGCTGGAGAATACTTACATCATTTACACCGCCGACCATGGTTA
CCATATTGGGCAGTTTGGACTGGTCAAGGGGAAATCCATGCCATATGACTTTGATATTC
GTGTGCCTTTTTTTATTCTGTTGTTCCAAGTGTAGAACCAGGATCAATAGTCCCACAGATC
GTTCTCAACATTGACTTGGCCCCCACGATCCTGGATATTGCTGGGCTCGACACACCTC
CTGATGTGGACGGCAAGTCTGTCTCAAACCTTCTGGACCCAGAAAAGCCAGGTAACA
GGTTTCGAACAAACAAGAAGGCCAAAATTTGGCGTGATACATTCTAGTGGAAAGAGG
CAAATTTCTACGTAAGAAGGAAGAATCCAGCAAGAATATCCAACAGTCAAATCACTTGC
CCAAATATGAACGGGTCAAAGAAGTATGCCAGCAGGCCAGGTACCAGACAGCCTGTG
AACAACCGGGGCAGAAAGTGGCAATGCATTGAGGATACATCTGGCAAGCTTCGAATTC
ACAAGTGTAAGGAGCCAGTGACCTGCTCACAGTCCGGCAGAGCACGCGGAACCTC
TACGCTCGCGGCTTCCATGACAAAGACAAAGAGTGCAGTTGTAGGGAGTCTGGTTAC
CGTGCCAGCAGAAGCCAAAGAAAGAGTCAACGGCAATTCTTGAGAAACCAGGGGAC
TCCAAAGTACAAGCCCAGATTTGTCCATACTCGGCAGACACGTTTCTTGTCCGTGCAA
TTTGAAGGTGAAATATATGACATAAATCTGGAAGAAGAAGAAGAAATTGCAAGTGTTGCA
ACCAAGAAACATTGCTAAGCGTCATGATGAAGGCCACAAGGGGGCCAAGAGATCTCCA
GGCTTCCAGTGGTGGCAACAGGGGGCAGGATGCTGGCAGATAGCAGCAACGCCGTGG
GCCCCACCTACCACTGTCCGAGTGACACACAAGTGTTTTATTCTTCCCAATGACTCTATC
CATTGTGAGAGAGAACTGTACCAATCGGCCAGAGCGTGGAAGGACCATAAGGCCTAC
ATTGATAAAGAGATTGAAGTTCTACAAGATAAAATTAAGAATTTAAGGGAAGTGAGGGG
ACACCTAAAGAAAAGGAAACCTGAGGAGTGTAGCTGTGGTGACCAGAGCTATTACAA
CAAAGAGAAAGGTGTCAAACGACAGGAGAAGCTAAAGAGTCACCTTCACCCCTTCAA
GGAGGCTGCTGCCCAGGAGGTGGATAGCAAACCTTCAGCTCTTCAAGGAGCATCGGA
GGAGGAAGAAGGAGAGGAAGGAGAAGAAACGGCAGAGGAAGGGGAGAGGAGTGTAG
CCTGCCTGGCCTTACCTGCTTCACCCATGACAACAACCACTGGCAGACTGCCCCATT
CTGGAACCTTGGGATCTTTCTGTGCCTGCACAAGTTCTAACAACAATACCTACTGGGTG
TTGCGTACAGTCAACGAGACGCACAATTTCTGTTTTGTGAGTTTGCTACTGGCTTTC
TGGAATATTTGACATGAATACGGATCCTTATCAGCTCACAAATACAGTACACACAGTA

FIG. 3Ai

GAACGAGGCATTTTGAATCAGCTACACGTACAACCTAATGGAGCTCAGAAGCTGTCA
AGGATATAAGCAGTGCAACCCAAGACCTAAGAATCTTGATGTTGGAAATAAAGATG
GAGGAAACTATGACCCGCACAGAGGACAGTTATGGGATGGATGGGAAGGTTAGTC
TTTCCAATGTTACTTCAGACACCAGCTGGCAAGGCCTGGAGGAGTTATCCGGTGC
AAGCGACATCGATGAGTACAGGTCTAACCCTAGACTAAGTCTGGAGGACTGGACT
AACTACCTGAGGGCTGTCTACAGAGCCTTTGCACTGCTGAACAGTCACCCTGATC
CAAACAAAGCAAATGGGACTCCAACCACACAAGGTGGTGACTTCCTGGT.CACCTC
TGCTGAGCGCTTGGTGCCAGCAGAGATGGCTTCTGCAGAATCAGGTGAAGACCC
AAGTCATGTGGTTGGGGAAACACCTCCTTTGACCTTGCCAGTCAACCTCCAAACC
CTGCATCTGAACAGACCAACGTTAAGTCCAGAGAGAAAACCTTGAATGGGATAATGA
CATTCCAGAAGTGAATCATTTGAATTCTGAACACTGGAGAAAAACTGAGAAGCAGA
TAGGATGGGAGGAGCTGCATCATCCTGAAGGTGACGTCGTCAGTGGCAATGGTAT
GACAGAGCTGCTGCCCCAGTCTCATCTTGGGCATCAGCTCACCAGTCAGCACCA
ACAAAAATGTTCCCAGGATGTGGAGACAGAGAAGGATGCTTTTGAAGATCAATTG
CGTCCTCTTGTCCTACTCTGACAGAACTCCGGTTCATC

FIG. 3A ii

102596-13401

>mouse SULF1 amino acid sequence--translation of ORF
MKYSLWALLLP LLGTQLLGTL CSTVRSQRFRGRIQQERKNIRPNILVLTDDQDVELGS
LQVMNKTRKIMEHGGATFINAFVTTMCCPSRSSMLTGKYVHNHNVTNNENCSSP
SWQAMHEPRTFAVYLNNTGYRTAFFGKYLNEYNGSYIPPGWREWLG LIKNSRFYNY
TVCRNGIKEKHGFDYAKDYFTDLITNESINYFKMSKRMYPHRPVMMVISHAAPHGPE
DSAPQFSKLYPNASQHITPSYNYAPNMDKHWIMQYTGPMLPIHMEFTNILQRKRLQT
LMSVDDSVRLYNMLVETGELENTYIIYTADHG YHIGQFGLVKGKSMPYDFDIRVPFFI
RGPSVEPGSIVPQIVLNIDLAPTILDIAGLDTPPDVDGKSVLKLDDPEKPGNRFRTNKK
AKIWRDTFLVERGKFLRKKEESSKNIQQSNHLPKYERVKELCQQARYQTACEQPGQ
KWQCIEDTSGKLRIHKCKGPSDLLTVRQSTRNLYARGFHDKDKECSCRESGYRASR
SQRKSQRQFLRNQGT PKYKPRFVHTRQTRSLSEFEFEIYDINLEEEEEELQVLQPRN
IAKRHDEGHKGPRDLQASSGGNRGRMLADSSNAVGPPTTVRVTHKCFILPNDSIHCE
RELYQSARAWKDHKAYIDKEIEVLQDKIKNLREVRGHLKKRKPEECSCGDQSYYNKE
KGVKRQEKLKSHLHPFKEAAAQEVDSKLQLFKEHRRRKKERKEKKRQRKGEECSLP
GLTCFTHDNNHWQTAPFWNLGSFCACTSSNNNTYWVLRTVNETHNFLFCFATGFL
EYFDMNTDPYQLTNTVHTVERGILNQLHVQLMELRSCQGYKQCNPRPKNLDVGNKD
GGNYDPHRGQLWDGWEG

FIG. 3B

FIG. 3B

>mouse SULF-2 cDNA (ORF in capital letters)

ggacgcgtgggcgagcgcgtggggtctgggcaacgcttctgcttctgagctcaacttaatttctcagagagcttcgg
agacgcgtgggaaggtcccaggcgctgggcagttcctcccgcgatctagcttgggatcggtcccgagccggcgtctc
caatgatcctgaggggaagaggggaaggaatcccacctcagacaccacctcggtcctgcatccaggaagaagca
aaggaccagcaagccacgccaATGGCACCCCTGGCCTGCCACTATGGCTGCTGTCCAC
CGCTCTCCTCTCCCTGCTGGCTGGCAGCTCGGCCTTCTCTCCCATCCCCGCCT
GAAGGGACGCTTCCAGAGGGACCGCAGGAACATCCGGCCCAACATCATCTTGGT
GCTTACGGATGACCAGGATGTGGAGCTGGGCTCCATGCAAGTGATGAACAAGACA
AGGCGTATCATGGAGCAGGGCGGGGCGCACTTCATCAATGCCTTCGTGACTACAC
CAATGTGCTGTCCGTCTCGCTCCTCCATTCTCACCGGCAAGTACGTCCACAACCA
CAACACCTACACCAACAATGAGAATTGTTCTCGCCCTCCTGGCAGGCCCCAGCAC
GAGAGCCGCACCTTCGCCGTGTATCTCAACAGCACAGGCTACCGGACAGCTTTCT
TCGGAAAATACCTCAATGAGTACAACGGCTCATACGTGCCGCCCGGCTGGAAGGA
GTGGGTGCGCCTACTTAAGAACTCCCGCTTTTATAACTACACACTCTGCCGGAATG
GGGTGAAGGAGAAACATGGCTCAGACTACTCCACGGATTACCTCACGGATCTCAT
CACCAATGACAGTGTGAGCTTCTTCCGAACATCCAAGAAGATGTACCCACACAGG
CCCGTGCTCATGGTCATCAGCCACGCGGCTCCCCACGGCCCCGAGGACTCGGC
ACCGCAGTACTCACGGCTCTTCCCCAATGCGTCCCAGCACATCACACCGAGTTAC
AACTATGCACCCAACCCAGACAAGCATTGGATCATGCGCTACACGGGACCCATGA
AGCCCATTCACATGGAATTCACCAACATGCTACAACGCAAACGCCTACAGACCCTC
ATGTCTGTGGATGACTCCATGGAGACGATCTATGACATGCTGGTGGAGACGGGGG
AGCTGGACAACACGTACATCCTGTACACCGCCGACCACGGCTACCACATTGGCCA
GTTTGGGCTGGTGAAGGGCAAGTCTATGCCGTATGAATTCGACATCAGAGTCCCG
TTCTACGTGAGGGGCCCCAACGTGGAAGCTGGCTCTCTGAACCCCCACATTGTC
CTCAACATTGACCTGGCCCCCACCATACTGGATATCGCTGGACTGGACATCCCTG
CAGACATGGACGGGAAGTCTATTCTCAAATACTGGACTCAGAGCGGCCAGTGAA
CCGGTTCACCTTGAAAAAGAAGCTGAGGGTCTGGCGAGACTCCTTCTGTTGGA
GAGAGGCAAACTGCTCCACAAGAGGGAGGGTGACAAAGTGAATGCCCAGGAGGA
GAACTTCCTGCCCAAGTACCAGCGCGTGAAGGACCTGTGTGAGCGAGCTGAGTA
CCAGACAGCATGCGAACAGCTGGGGCAGAAGTGGCAGTGTGTGAGGACGCTT
CTGGGACGCTGAAGCTGCACAAATGTAAAGGCCCATGCGGTTTGGTGGCGCG
GTGGCAGCAGAGCCCTCTCCAACCTGGTGCCCAAGTATGACGGCCAGAGCAGCG
AGGCCTGCAGCTGTGACAGTGGCGGTGGAGGGGACTACAACTGGCCTGGCT
GGACGCCGTAAAGCTCTTTAAGAAAAAGTATAAGACCAGCTATGCCCGGAACCGCT
CCATCCGTTCCGTGGCCATCGAGGTGGACGGTGAGATATACCACGTAGGCTTGGA
TACTGTGCCTCAGCCCCGCAACCTTAGCAAGCCGCACTGGCCAGGGGCCCTGA
AGACCAAGATGACAAGGATGGTGGCAGTTTCAGTGGTACTGGTGGCCTTCCAGAT
TATTCTGCCCCCAATCCCATCAAAGTGACCCATCGGTGCTACATCCTTGAGAATGA
CACAGTCCAGTGCGACTTGGACCTGTACAAGTCCCTGCAGGCTTGGAAGACCA
CAAGCTGCACATCGACCATGAGATCGAAACCCTGCAGAACAAATTAAGAACCCTC
GAGAAGTCAGGGGTACCTGAAGAAGAAGCGACCGGAAGAATGTGACTGCCATA
AAATCAGTTACCACAGCCAACACAAAGGCCGTCTCAAGCACAAAGGCTCCAGCCT
GCACCCTTTCAGGAAGGGTCTGCAGGAGAAGGACAAGGTGTGGCTGCTGCGGG
AGCAGAAACGCAAGAAGAACTGCGCAAGCTGCTCAAACGGCTGCAGAACAACG
ATACGTGCAGCATGCCCGGCCTCACGTGCTTTACCCACGACAACCACCTGGCA
GACGGCGCCACTCTGGACGCTGGGGCCGTTCTGCGCCTGCACCAGCGCCAACA
ACAACACGTAAGTGGTCTTGAGGACCATAAATGAGACCCACAACCTTCTCTG
GAATTTGCAACCGGCTTCATAGAATACTTTGACCTCAGTACAGACCCCTACAGCT
GATGAACGCGGTGAACACACTGGACAGGGACGTCCTTAACCAACTGCACGTGCA
GCTCATGGAGCTAAGGAGCTGTAAAGGCTACAAGCAGTGCAACCCCCGACCCG
CAACATGGACCTGGGGCTTAGAGACGGAGGAAGCTATGAACAATACAGGCAGTTT
CAGCGTCGAAAATGGCCAGAAATGAAGAGACCTTCTTCCAAATCACTGGGACAGC
TATGGGAAGGTTGGGAAGGCTAAgcggccatagagagaggaacctccaaaaccaggggcctcgtgtg

FIG. 4A i

gctgcccaggccatgcaaaaaacacccgattcccagaagatgaatgttggaactgggagacctgacagaaggcagg
gctgctcttgggacaggaaatcctggaggacagcgctggactttccgatgctcagtttcttgccttgctctggatca
aacctcactggctgctctgggatgctgctcacacctggagtctctgctcacctttcagaggctcacaagacaaagga
actaattccatggacacttctccagagatggaaattgctgggattcgccactcctcccctgcacccctccccagtc
ctaggggaagcaagctgttttaaccttcttactcttggagaaagcacggacatcccagggtgctgtcaacctcacagtctga
caaagtctatagcacaaaacagtaccattcaccagggtggttgacctggctggctcagaagctgccttcaccacatacat
gaccgctcacacgtaaccaacacagggaattgtaggggaatctcactaatatgaaatcccgctttcaagagtcgcggtg
tcaataaacgctgtggctaggatcaaggataatcccttgagctttcagacattattcctgcccgggattcggtcctttgtatcc
atcccagaactgatgttttctaaggtaccgaaacccaagtgatgtgtgtcctgtgtttaatgacattgtattgtaaagttt
gtagtataagtaccatcttacagtggtcctgccccagccaatgtctagctattggtatgaaaaaaaaaattcttgaattttg
taaaaaaaaaaaaaa

FIG. 4A ii

FIG. 4A ii

>mouse SULF2 amino acid sequence--translation of ORF
MAPPGPLWLLSTALLSLLAGSSAFLSHPRKGRFQRDRRNIRPNILVLTDQDVELGSM
QVMNKTRRIMEQGGGAHFINAFVTTMPCCPSRSSILTGYVHNHNTYTNNECSPSWQ
AQHESRTFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFYNYTLCRN
GVKEKHGSDYSTDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHGPEDSAPQYS
RLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKRLQTLMSVDDSM
ETIYDMLVETGELDNTYILYADHGYHIGQFGLVKGKSMPIYEFDIRVPFYVRGPNVEAGSL
NPHIVLNIDLAPTILDIAGLDIPADMDGKSILKLLDSERPVNRFHLKKKLRVWRDSFLVERG
KLLHKREGDKVNAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCVEDASGTLKL
HKCKGPMRFGGGGGSRALSNLVPKYDGQSSEACSCDSGGGGDYKLGLAGRRKLFKKK
YKTSYARNRSIRSVAIEVDGEIYHVGLDTPVQPRNLSKPHWPGAPEDQDDKDGGSFSGT
GGLPDYSAPNPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKIKNLR
EVRGHLKKKRPEECDCHKISYHSQHKGRCLKHKGSSLHPFRKGLQEKDKVWLLREQKRK
KKLRKLLKRLQNNDTCSMPGLTCFTHDNHHWQTAPLWTLGPFCACTSANNNTYWCLRT
INETHNFLFCEFATGFIEYFDLSTDPYQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQC
NPRTRNMDLGLRDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWEG-

FIG. 4B

FIG. 4B

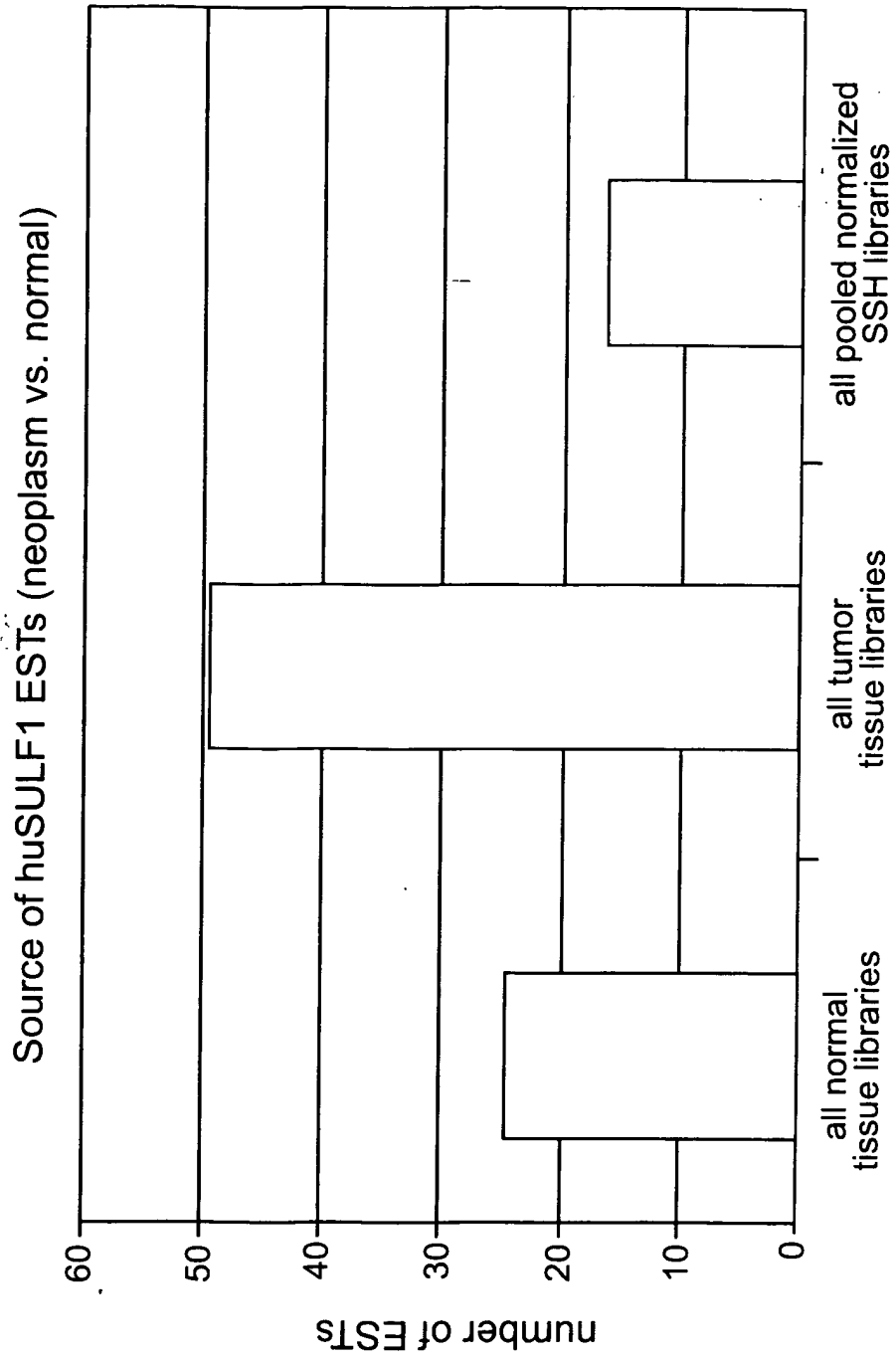


FIG. 5

FIG. 5

Source of huSULF1 ESTs (detailed)

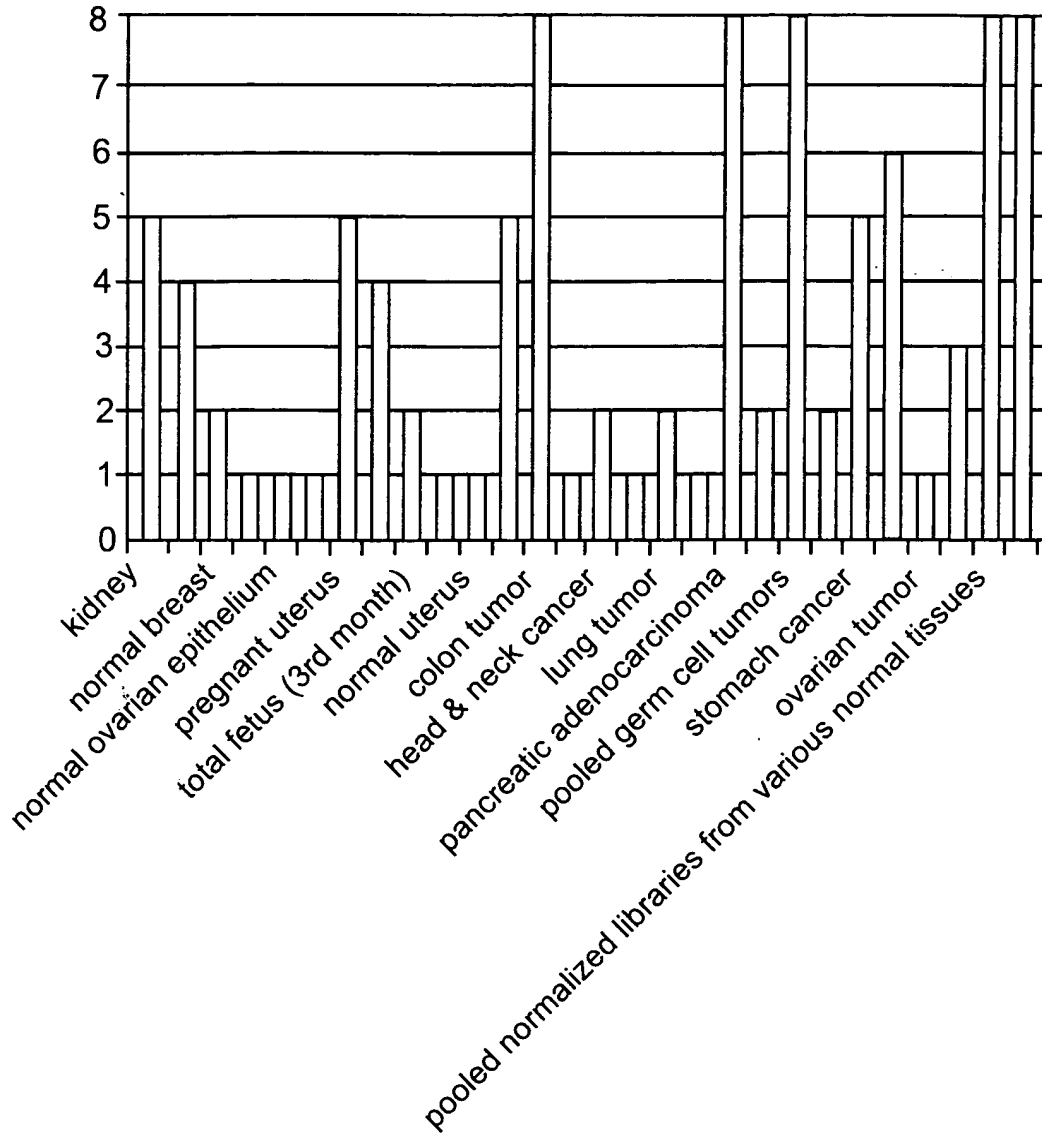


FIG. 6

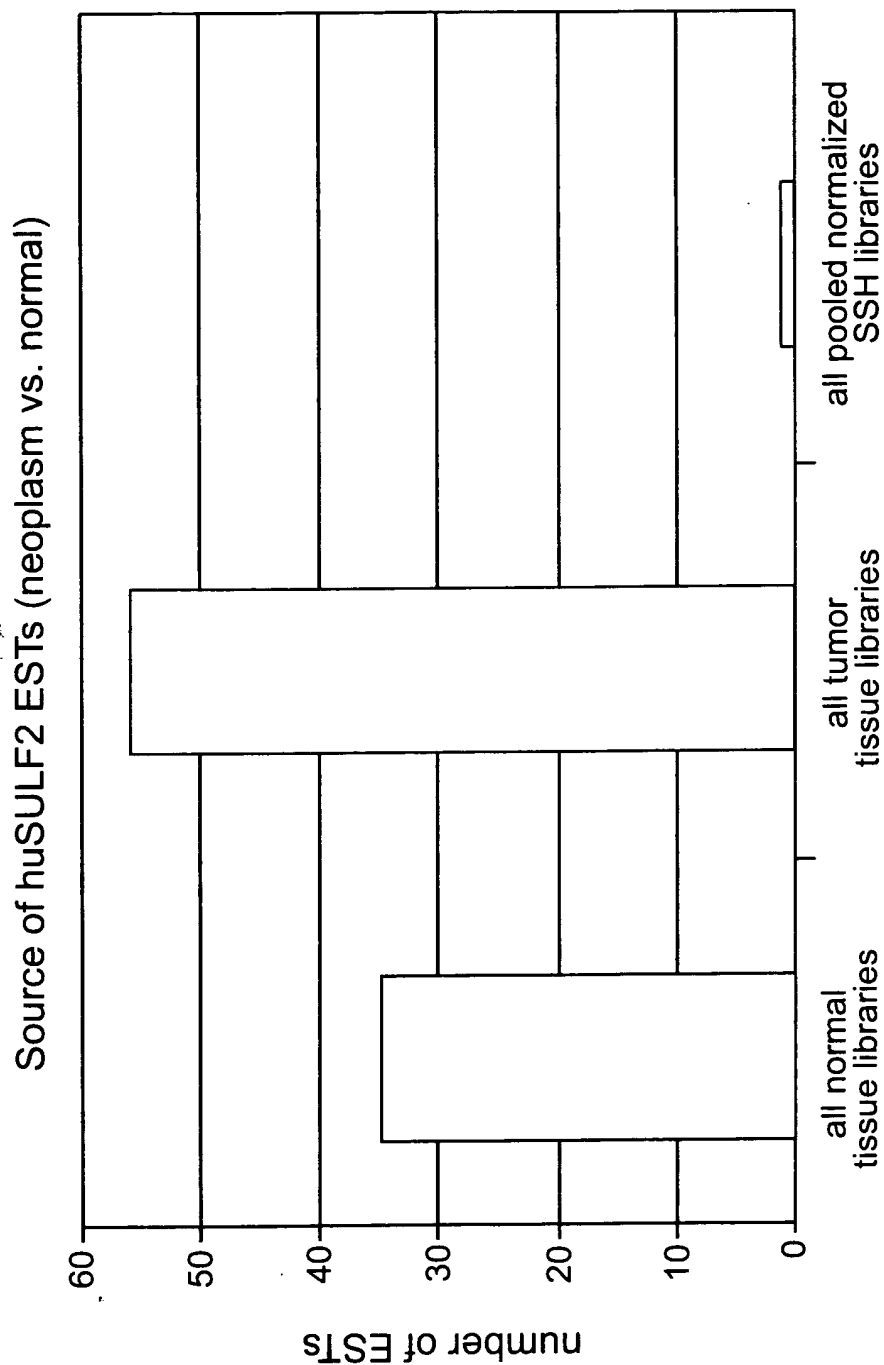


FIG. 7

FIG. 7

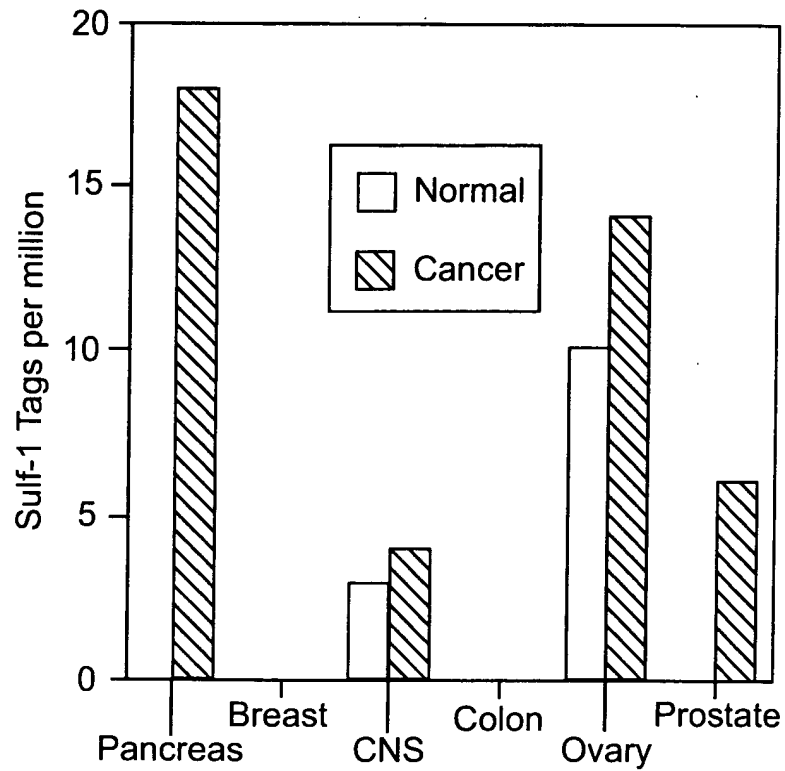


FIG. 8

FOOTNOTES

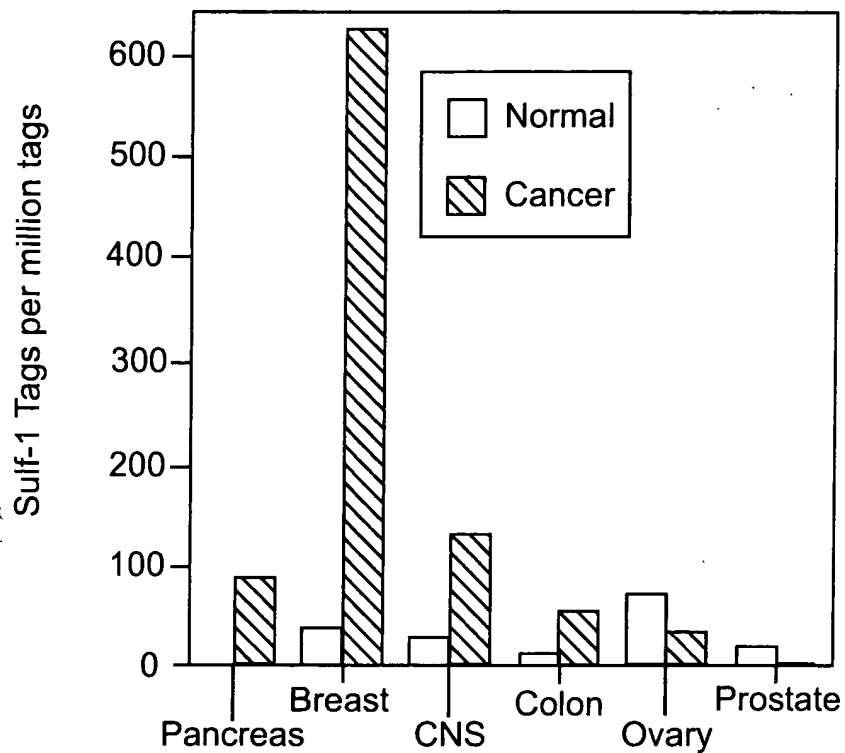


FIG. 9

> human SULF2 full length cDNA (ORF is highlighted in capitals and a 5' inframe stopcodon is underscored)

ggcacgagggccatttctggacaacagctgctattttcacttgagcccaagttaatttctcggggagttctcgggcgcgacaca
ggcagctcggtttgccttgcgattgagctgcgggtcgcgccggcgccgctctccaatggcaaagtgtgtgtggctggag
gcgagcgcgaggctttcggaagcagtcgagtggttcagaccggggcgagtcctgtgaaagcagataaaagaaaa
cattattaacgtgtcattacgaggggagcgcccgccggggctgtgcactccccgcgaacatttggctccctccagctc
ctagagaggagaagaagaagcggaaaagaggcagattcacgtcgttccagccaagtggacctgatcgatggccctc
ctgaatttatcacgatatttatttagcgatgccccctggttgtgtgttacgcacacacacgtgcacacaaggctctggctc
gcttccctccctcgttccagctcctggggaatccacatctgttcaactctccgccgagggcgagcaggagcgagagtg
gtcgaatctgcgagtgagagggagcaggggaaaagaacaaagccacagacgcaacttgagactcccgcatcccaa
aagaagcaccgatcagcaaaaaagaagATGGGCCCCCGAGCCTCGTGCTGTGCTTGCTG
TCCGCAACTGTGTTCTCCCTGCTGGGTGGAAGCTCGGCCTTCCTGTCGCACCACC
GCCTGAAAGGCAGGTTTCAGAGGGACCGCAGGAACATCCGCCCAACATCATCCTG
GTGCTGACGGACGACCAGGATGTGGAGCTGGGTTCCATGCAGGTGATGAACAAGA
CCCGGCGCATCATGGAGCAGGGCGGGGCGCACTTCATCAACGCCTTCGTGACCAC
ACCATGTGCTGCCCCCTCACGCTCCTCCATCCTCACCGGCAAGTACGTCCACAACC
ACAACACCTACACCAACAATGAGAACTGCTCCTCGCCCTCCTGGCAGGCACAGCAC
GAGAGCCGCACCTTTGCCGTGTACCTCAATAGCACTGGCTACCGGACAGCTTTCTT
CGGGAAGTATCTTAATGAATACAACGGCTCCTACGTGCCACCCGGCTGGAAGGAGT
GGGTCGGACTCCTTAAAACTCCCGCTTTTATAACTACACGCTGTGTGCGGAACGGGG
TGAAAGAGAAGCACGGCTCCGACTACTCCAAGGATTACCTCACAGACCTCATCACC
AATGACAGCGTGAGCTTCTTCCGCACGTCCAAGAAGATGTACCCGCACAGGCCAGT
CCTCATGGTCATCAGCCATGCAGCCCCCACGGCCCTGAGGATTACGCCCCACAAT
ATTCACGCCTCTTCCCAAACGCATCTCAGCACATCACGCCGAGCTACAACCTACGCGC
CCAACCCGGACAAACACTGGATCATGCGCTACACGGGGCCCATGAAGCCCATCCAC
ATGGAATTCACCAACATGCTCCAGCGGAAGCGCTTGAGACCCCTCATGTGCGGTGGA
CGACTCCATGGAGACGATTTACAACATGCTGGTTGAGACGGGCGAGCTGGACAACA
CGTACATCGTATACACCGCCGACCACGGTTACCACATCGGCCAGTTTGGCCTGGTG
AAAGGGAAATCCATGCCATATGAGTTTGACATCAGGGTCCCGTTCTACGTGAGGGGG
CCCAACGTGGAAGCCGGCTGTCTGAATCCCCACATCGTCCTCAACATTGACCTGGC
CCCCACCATCCTGGACATTGCAGGCCTGGACATACCTGCGGATATGGACGGGAAAT
CCATCCTCAAGCTGCTGGACACGGAGCGGCCGTGAATCGGTTTCACTTGAAAAAG
AAGATGAGGGTCTGGCGGGACTCCTTCTTGGTGGAGAGAGGCAAGCTGCTACACA
AGAGAGACAATGACAAGGTGGACGCCAGGAGGAGAACTTTCTGCCCAAGTACCA
GCGTGTGAAGGACCTGTGTGAGCGTGCTGAGTACCAGACGGCGTGTGAGCAGCTG
GGACAGAAGTGGCAGTGTGTGGAGGACGCCACGGGGAAGCTGAAGCTGCATAAGT
GCAAGGGCCCCATGCGGCTGGGCGGCAGCAGAGCCCTCTCCAACCTCGTGCCCA
AGTACTACGGGCAGGGCAGCGAGGCCTGCACCTGTGACAGCGGGGACTACAAGCT
CAGCCTGGCCGGACGCCGGAaaaaaactcttcaagaagaagtacaaggccagctatg
TCCGCAGTCGCTCCATCCGCTCAGTGGCCATCGAGGTGGACGGCAGGGTGTACCA
CGTAGGCCTGGGTGATGCCGCCCAGCCCCGAAACCTCACCAAGCGGCACTGGCCA
GGGGCCCCCTGAGGACCAAGATGACAAGGATGGTGGGGACTTCAGTGGCACTGGAG
GCCTTCCCGACTACTCAGCCGCCAACCCTTAAAGTGACACATCGGTGCTACATCC
TAGAGAACGACACAGTCCAGTGTGACCTGGACCTGTACAAGTCCCTGCAGGCCTGG
AAAGACCACAAGCTGCACATCGACCACGAGATTGAAACCCTGCAGAACAAAATTAAG
AACCTGAGGGAAGTCCGAGGTACCTGAAGAAAAAGCGGCCAGAGAAGTGTGACT
GTCACAAAATCAGCTACCACACCCAGCACAAAGGCCGCTCAAGCACAGAGGCTCC
AGTCTGCATCCTTTCAGGAAGGGCCTGCAAGAGAAGGACAAGGTGTGGCTGTTGC
GGGAGCAGAAGCGCAAGAAGAACTCCGCAAGCTGCTCAAGCGCCTGCAGAACAA

FIG. 10A i

10025966-123101

CGACACGTGCAGCATGCCAGGCCTCACGTGCTTCACCCACGACAACCAGCACTGG
CAGACGGCGCCTTTCTGGACACTGGGGCCTTTCTGTGCCTGCACCAGCGCCAACA
ATAACACGTACTGGTGCATGAGGACCATCAATGAGACTCACAATTTCTCTTCTGTG
AATTTGCAACTGGCTTCCTAGAGTACTTTGATCTCAACACAGACCCCTACCAGCTGA
TGAATGCAGTGAACACACTGGACAGGGGATGTCCTCAACCAGCTACACGTACAGCTC
ATGGAGCTGAGGAGCTGCAAGGGTTACAAGCAGTGTAACCCCCGGACTCGAAACA
TGGACCTGGGACTTAAAGATGGAGGAAGCTATGAGCAATACAGGCAGTTTCAGCGT
CGAAAGTGGCCAGAAATGAAGAGACCTTCTTCCAAATCACTGGGACAACCTGTGGG
AAGGCTGGGAAGGTTAAgaaacaacagaggtggacctccaaaaacatagaggcatcacctgactgcacag
gcaatgaaaaacatgtgggtgattccagcagacctgtgctattggccaggaggcctgagaaagcaagcagcactct
cagtcaacatgacagattctggaggataaccagcaggagcagagataacttcaggaagtcattttgcccctgctttgct
ttggattatacctcaccagctgcacaaaatgcatttttcgtatcaaaaagtcaccactaacctccccagaagctcaca
aggaaaacggagagagcgagcgagagagatttccttgaaattctcccaaggcgaaagtcattggaattttaaatca
taggggaaaagcagtcctgttctaaatcctcttattctttggttgacaaaagaaggaaactaagaagcaggacagaggc
aacgtggagaggctgaaaacagtgacagagcgttgacaatgagtcagtagcacaaaagagatgacatttacctagca
tataaaccttggtgcctctgaagaaactgccttcattgtatatagtgactattacatgtaatcaacatgggaacttttagggg
aacctaataagaaatcccaatttcaggagtggtggtgtcaataaacgctctgtggccagtgtaaaagaaaaaaaaaa
aaattgtggacatttctgttctgtccagataccatttctcctagttattcttggttatgtccagaactgatgttttttaagggtact
gaaaagaaatgaagttgatgtatgtcccaagtttgatgaaactgtattgtaaaaaaattttgtagtttaagtattgtatata
gtgttcaaaacccagccaatgaccagcagttggtatgaagaacctttgacattttgtaaaaggccatttctggggaaaaa
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

FIG. 10A ii

FIG. 10A ii

>human SULF2 protein (translation of ORF)
MGPPSLVLCLLSATVFSLLGGSSAFLSHHRLKGRFQRDRRNIRPNIILVLTDDQDVELGS
MQVMNKTRRIMEQGGAHFINAFVTTPMCCPSRSSILTGKYVHNHNTYTNNENCSSPS
WQAQHESTRFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFYNYTL
CRNGVKEKHGSDYSKDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHGPEDSA
PQYSRLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKRLQTLMSV
DDSMETIYNMLVETGELDNTYIVYTADHGYHIGQFGLVKGKSMPYEFDIRVPFYVRGPN
VEAGCLNPHIVLNIDLAPTILDIAGLDIPADM DGKSILKLLDTERPVNRFHLKKKMRVWRD
SFLVERGKLLHKRDNDKVDAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCVED
ATGKLLHKCKGPMRLGGSRALSNLVPKYYGQGSEACTCDSGDYKLSLAGRRKKLFFK
KYKASYVRSRSIRSVAIEVDGRVYHVGLGDAQAQPRNLTKRHWPGAPEDQDDKDGGDF
SGTGGLPDYSAANPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHLKHLIDHEIETLQNKI
KNLREVRGHLKKKRPEECDCHKISYHTQHKGRLKHRGSSLHPFRKGLQEKD KVVLLR
EQKRKKKLRKLLKRLQNNDTCSMPGLTCFTHDNQHWQTAPFWTLGPFCACTSANNNT
YWCMRTINETHNFLFCEFATGFLEYFDLNTDPYQLMNAVNTLDRDVLNQLHVQLMELR
SCKGYKQCNPRTNRNMDLGLKDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWE
G

FIG. 10B

FIG. 10B

>mouse SULF2 full length cDNA (ORF highlighted in capitals)

ggcgccggagatcctgaggggaagaggggaaggaatcccatcctcacgacaccacctcggcctctgcatccaggaagaa
gcaaaggaccagcaagccacgccaATGGCACCCCTGGCCTGCCACTATGGCTGCTGTCCAC
CGCTCTCCTCTCCCTGCTGGCTGGCAGCTCGGCCTTCTCTCCCATCCCCGCCTGA
AGGGACGCTTCCAGAGGGACCGCAGGAACATCCGGCCCAACATCATCTTGGTGCTT
ACGGATGACCAGGATGTGGAGCTGGGCTCCATGCAAGTGATGAACAAGACAAGGCG
TATCATGGAGCAGGGCGGGGCGCACTTCATCAATGCCTTCGTGACTACACCAATGTG
CTGTCCGTCTCGCTCCTCCATTCTCACCGGCAAGTACGTCCACAACCACAACACCTA
CACCAACAATGAGAATTGTTCTCGCCCTCCTGGCAGGCCCAGCACGAGAGCCGCA
CCTTCGCCGTGTATCTCAACAGCACAGGCTACCGGACAGCTTTCTTCGGAAAATACCT
CAATGAGTACAACGGCTCATACTGCGCCCGGCTGGAAGGAGTGGGTGGCCTAC
TTAAGAACTCCCGCTTTTATAACTACACACTCTGCCGGAATGGGGTGAAGGAGAAACA
TGGCTCGGACTACTCCACGGATTACCTCACGGATCTCATCACCATGACAGTGTGAG
CTTCTTCCGAACATCCAAGAAGATGTACCCACACAGGCCCGTGCTCATGGTCATCAG
CCACGCGGCTCCCCATGGCCCCGAGGACTCAGCACCCAGTACTCACGGCTCTTCC
CCAATGCGTCCCAGCACATCACACCGAGTTAGAATATGCACCCAACCCAGACAAGC
ATTGGATCATGCGCTACACGGGACCCATGAAGCCCATTCACATGGAATTCACCAACAT
GCTACAACGAAAACGCCTACAGACCCTCATGTCTGTGGATGACTCCATGGAGACGAT
CTATGACATGCTGGTGGAGACGGGGGAGCTGGACAACACGTACATCCTGTACACCGC
CGACCACGGCTACCACATTGGCCAGTTTGGGCTGGTGAAGGGCAAGTCTATGCCGTA
TGAATTCGACATCAGAGTCCCGTTCTACGTGAGGGGGCCCCAACGTGGAAGCTGGCT
CTCTGAACCCCCACATTGTCTCAACATTGACCTGGCCCCCACCATACTGGATATCGC
TGGACTGGACATCCCTGCAGACATGGACGGGAAGTCTATTCTCAAATACTGGACTC
AGAGCGGCCAGTGAACCGGTTCCACTTGAAAAAGAAGCTGAGGGTCTGGCGAGACT
CCTTCTGGTGGAGAGAGGCAAATGCTCCACAAGAGGGGAGGGTGACAAAGTGAAT
GCCCAGGAGGAGAACTTCTGCCCAAGTACCAGCGCGTGAAGGACCTGTGTACAGC
AGCTGAGTACCAGACAGCATGCGAACAGCTGGGGCAGAAGTGGCAGTGTGTGGAGG
ACGCTTCTGGGACGCTGAAGCTGCACAAATGTAAAGGCCCCCATGCGGTTTGGTGGC
GGCGGTGGCAGCAGAGCCCTCTCCAACCTGGTGCCCAAGTATGACGGCCAGAGCA
GCGAGGCCTGCAGCTGTGACAGTGGCGGTGGAGGGGACTACAACTGGGCCTGGC
TGGACGCCGTAAGCTCTTTAAGAAAAAGTATAAGACCAGCTATGCCCGGAACCGCTC
CATCCGTTCCGTGGCCATCGAGGTGGACGGTGAGATATACCACGTAGGCTTGGATAC
TGACCTCAGCCCCGCAACCTTAGCAAGCCGCACTGGCCAGGGGGCCCTGAAGACC
AAGATGACAAGGATGGTGGCAGTTTCAGTGGTACTGGTGGCCTTCCAGATTATTCTGC
CCCCAATCCCATCAAAGTGACCCATCGGTGCTACATCCTTGAGAATGACACAGTCCAG
TGCGACTTGGACCTGTACAAGTCCCTGCAGGCTTGGAAGACCACAAGCTGCACATC
GACCATGAGATCGAAACCCTGCAGAACAAAATTAAGAACCTTCGAGAAGTCAGGGGT
CACCTGAAGAAGAAGCGACCGGAAGAATGTGACTGCCATAAATCAGTTACCACAGC
CAACACAAAGGCCGTCTCAAGCACAAAGGCTCCAGCCTGCACCCTTTCAGGAAGGG
TCTGCAGGAGAAGGACAAGGTGTGGCTGCTGCGGGAGCAGAAACGCAAGAAGAAA
CTGCGCAAGCTGCTCAAACGGCTGCAGAACAAACGATACGTGCAGCATGCCCGGCCT
CACGTGCTTTACCCACGACAACCACCACTGGCAGACGGCGCCACTCTGGACGCTGG
GGCCGTTCTGCGCCTGCACCAGCGCCAACAACAACACGTAAGTGGTGGTGGAGACC
ATAAATGAGACCCACAACCTTCTCTTCTGCGAATTTGCAACCGGCTTCATAGAATACTT
TGACCTCAGTACAGACCCCTACCAGCTGATGAACGCGGTGAACACACTGGACAGGG
ACGTCCTTAACCAACTGCACGTGCAGCTCATGGAGCTAAGGAGCTGTAAAGGCTACA
AGCAGTGCAACCCCCGGACCCGCAACATGGACCTGGGGCTTAGAGACGGAGGAAG
CTATGAACAATACAGGCAGTTTCAGCGTCGAAAATGGCCAGAAATGAAGAGACCTTCT
TCCAAATCACTGGGACAGCTATGGGAAGGTTGGGAAGGCTAAGcgccatagagagaggaac

FIG. 11Ai

ctccaaaaccaggggacctgctggtgcccaggccatgcaaaaaacacccgattcccagaagatgaatgttgaact
gggagacctgacagaaggcagggcctgctcttgggacaggaaatcctggaggacagcgccctggactttccgatgtca
gtttcttggccctgcttggctgatcaaacctcactggctgctctgggatgctgctcacacctggagtctctgctcacctttc
agaggctcacaagacaaaggaactaatttccatggacacttctccagagatggaaattgctgggattcgcccactcct
ccctgcacccctccccagtcactaggggaagcaagctgttttaaccttcttactcttggagaaagcacggacatcca
ggtgctgtcaacctcacagtcttgacaaagtctatagcacaaaacagtaccattcaccaggctggtgacctggctggctc
agaagctgccttcaccacatacatgaccgctcacacgtaaccaacacagggaattgtagggaatctactaatatgaa
atcccgctttcaagagtcgcggtgtcaataaacgctgtggctaggatcaaggataatcccttgagcttccagacatttattcct
gcccggttgcgttcttggatccatcccagaactgatgttttctaaggtagcgaaccccaagtgatgtgtgtcctgtgttt
aatgacattgtattgtaaagttttagtataagtaccatcttacagtgttctgccccagccaatgtctagctattggtatgaa
aaaaaaaaatcttgaattttgtaaaaaaaaaaaaaaaaa

FIG. 11A ii

FIG. 11A ii

>mouse SULF2 protein (translation of ORF)
MAPPGPLPLWLLSTALLSLLAGSSAFLSHPRLKGRFQRDRRNIRPNILVLTDDQDVELG
SMQVMNKTRRIMEQGGGAHFVTTMCCPSRSSILTGKYVHNHNTYTNNENCSS
PSWQAQHESTRFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFY
NYTLCRNGVKEKHGSDYSTDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHG
PEDSAPQYSRLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKR
LQTLMSVDDSMETIYDMLVETGELDNTYILYTADHGYYHIGQFGLVKGKSMPEYFDIRV
PFYVRGPNVEAGSLNPHIVLNIDLAPTILDIAGLDIPADMKGKLSILKLLDSERPVNRFHL
KKKLRVWRDSFLVERGKLLHKREGDKVNAQEENFLPKYQRVKDLQCRAEYQTACE
QLGQKWQCVEDASGTLKLHKCKGPMRFGGGGGSRALSNLVPKYDGGSSSEACSCD
SGGGGDYKLGLAGRRKLFKKKYKTSYARNRSIRSVAIEVDGEIYHVGLDTPVQPRNL
SKPHWPGAPEDQDDKDGGSFSGTGGLPDYSAPNPIKVTHRCYILENDTVQCDLDLY
KSLQAWKDHKLHIDHEIETLQNKIKNLREVRGHLKKKRPEECDCHKISYHSQHKGRL
KHKGSSLHPFRKGLQEKDQVWLLREQKRKKLRKLLKRLQNNDTCMPGLTCFTHD
NHHWQTAPLWTLGPFCACTSANNNNTYWCLRTINETHNFLFCEFATGFIEYFDLSTDP
YQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQCNPRTRNMDLGLRDGGSYEQYR
QFQRRKWPEMKRPSSKSLGQLWEGWEG

FIG. 11B

1005966-122101

FIG. 12

Genomic Organization of huSULF2 gene
numbers represent base pairs

Contig exon start end length gap

<div>I</div> 159532	1	66100	66668	568	
					28587
	2	95255	95529	274	
					20271
	3	115800	116039	239	
					34042
	4	150081	150232	151	

>13577

<div>II</div> 2152	5	1508	1677	169	
--------------------	---	------	------	-----	--

>5146

<div>III</div> 17546	6	4672	4822	150	
					1266
	7	6088	6263	175	
					4190
	8	10453	10581	128	
					1543
	9	12124	12180	56	
					455
	10	12635	12764	129	
					4101
	11	16865	17060	195	

>4971

<div>IV</div> 87036	12	4486	4714	228	
					308
	13	5022	5118	96	
					564
	14	5682	5776	94	
					1010
	15	6786	6845	59	
					508
	16	7353	7522	169	
					241
	17	7763	7905	142	
					1225
	18	9130	9253	123	
					2043
	19	11296	11329	33	
					245
	20	11574	11627	53	
					1007
	21	12634	13620	986	

FIG. 12

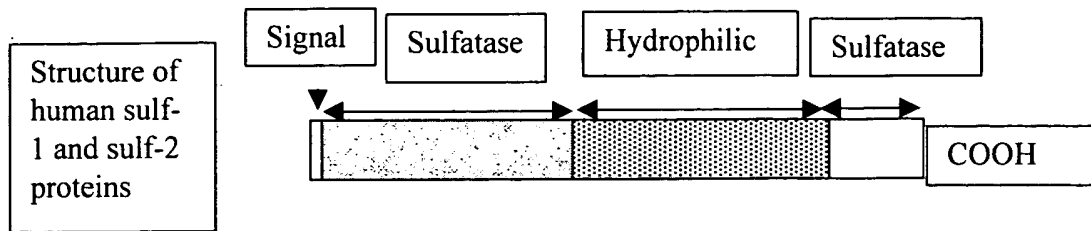


FIG. 13

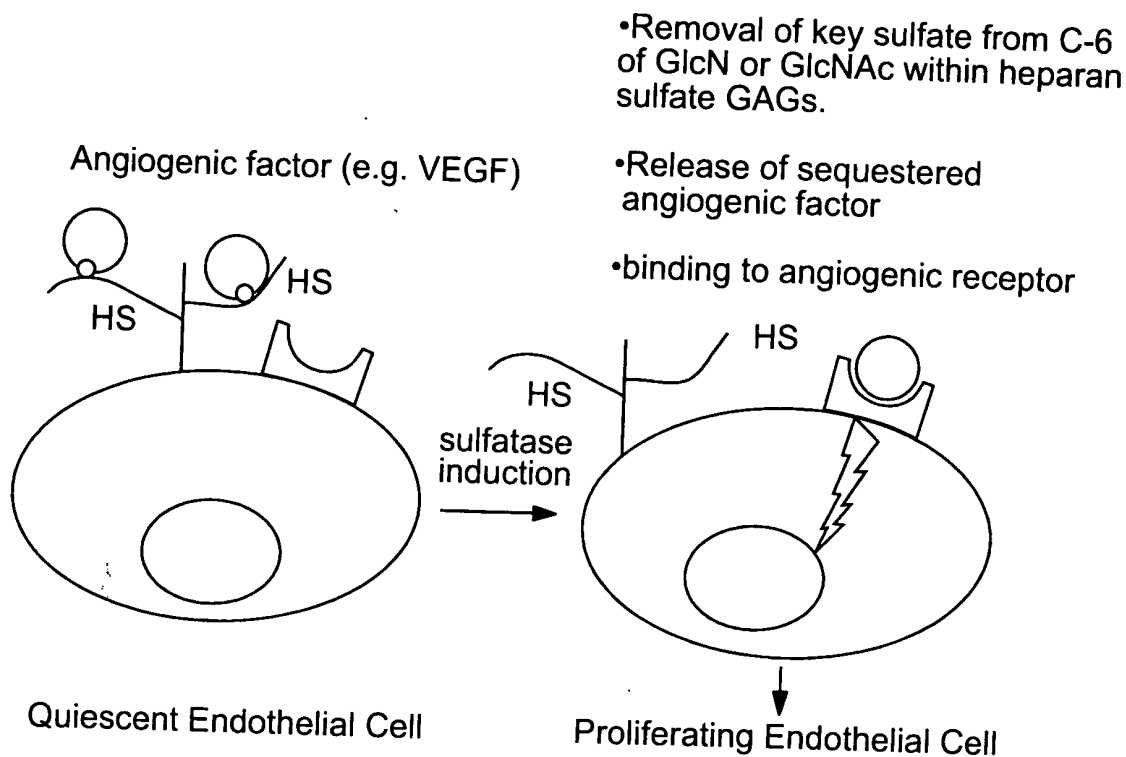


FIG. 14